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To Determine the Seroprevalence of Hepatitis C Virus in Patients of Teku Hospital, Nepal, Kathmandu

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Abstract

The project "Hepatitis C and evaluation of treatment outcome" was taken to study the rarely touched aspect associated with Hepatitis C. Most of the studies conducted in Nepal are focused on the prevalence of hepatitis C surface antigen. It detects active disease only but does not detect the infections of the past which became immune naturally. The present study hence was conducted to determine the sero-prevalence and the epidemiological characteristics of Hepatitis C. The research was carried out in Teku Hospital Kathmandu Nepal where prevalence of hepatitis C virus (HCV) infection in 2700 HIV infection patients with a functioning graft was studied."

A Univariate Analysis was used, and included calculation of odd ratios for hepatitis C infection by each variable of interest, including sex, age, profession, marital status, history of jaundice by the patient, invasive procedure, and history of blood transfusion and practice of Universal precautions by providing medicines and liver biopsy test easily. The result showed that there was a low frequency of HCV in all the patients infected with HIV. In Teku Hospital, 100 among 2700 patients were infected with hepatitis C (3.703%). This suggests that preventive measures for this disease can improve the situation significantly.

Presently, Teku Hospital uses antiviral drugs, vitamin complexes and common anti-inflammatory, anti-pyretic drugs to provide immediate relief to the patients. But in absence of interferon in the treatment, the patients don't get proper respite. Interferons being expensive are not easy to access. For the betterment of the situation, interferons like (Pegylated Interferons) and Ribavirin should be included in the list of essential drugs in Nepal, along with implementation of proper preventive measures against HCV.

Abbreviations

HCV-Hepatitis C Virus; HCC-Hepatocellular Carcinoma; HIV-Human Immune deficiency Virus; RNA- Ribo Nucleic Acid; CLH-Chronic Lobular Hepatitis; CAH- Congenital Adrenal Hyperplasia; CPH-Corposes per Hour; ALT-Alanine amino Transferase; ELISA-Enzyme-linked immunosorbent assay; RIBA- Recombinant Immunoblot Assay; HBV-Hepatitis B Virus

Introduction

Hepatitis is a global word eloquent inflammation of the liver and engender by variety of viruses like A, B, C, D and E. In 1989 the virus liable majorly transfusion associated non-A and non B was termed Hepatitis C virus [1-3]. Hepatitis C is the result by infection with hepatitis C virus, an immured single stranded, positive sense RNA virus [2-4]. The virus spread among liver cells and damage the liver with long term complications [5]. Hepatitis starts with anorexia, huge abdominal discomfort, fever and lethargy, debility, nausea and vomiting progressing to jaundice in about 25% patients and is generally less frequent as compared to hepatitis B [5-9]. Those who are vulnerable to HCV, about 40% regain health but rest become chronic carriers. And 20% of these evolved in cirrhosis and then developed liver cancer [5,6].

Hepatitis C in today's context is the most occurred disease in the whole world as it refers to the inflammation of the liver. In this case, liver is totally damaged which leads to the accumulation of inflammatory cells. Acute Hepatitis and Chronic Hepatitis are two different phases of Hepatitis. HCV which is called as a viral disease which is caused by the exposure of infected blood from the infected person transferred into the healthy body.

The main transmission route of this HCV is parental route, perinatal contact and sexual route. Mainly High risk group include different sectors of people especially health care workers, sex workers, homosexuals, heterosexuals with multiple partners, intravenous drug addicts and child born to HCV–positive mothers etc [1]. Seroprevalence of Anti-HCV among the general population of Nepal and the blood donors has been reported which ranges from 0.3% to 1.7%.

In context to Nepal, Having visited all the hospitals of Kathmandu, lack of concentration of required subjects in general hospitals, Teku Hospital is finally selected for research. During the tenure of a month 2700 HIV patients were studied among which 600 of them had been infectious with mostly Hepatitis C virus and Hepatitis B virus.

Mostly, the studies which were conducted in India and Nepal's report, prevalence of HCV surface antigen among different people, detects only the active disease and it does not detect those who were infected and became immune naturally. So, our recent studies were based on to find out the epidemiological characteristics and seroprevalence of Hepatitis C among the different samples of patients in Teku Hospital, Kathmandu.

Aims of this study

To determine the seroprevalence of hepatitis C virus in patients of Teku hospital, Nepal, Kathmandu

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Objectives of this study

To find out the distribution of HCV infection with reference to study variables such as age, sex, type of worker, marital status

To find out the humoral immunological status of the person

Review of Literature

Historical background

A group of 15% of 1289 shipyard workers were parenterally transmitted by hepatitis is an outbreak of jaundice in 1885. Lumen, a thoughtful and perceptive German public health official who studied the outbreak ,attributed it to the earlier receipt by these workers of small pox vaccine containing glycerinated lymph of human origin.

A dramatic epidemic in 1942 of icteric hepatitis involving 50,000 US servicemen represented the final proof of the existence of parenterally transmissible HCV. Mainly, the epidemic followed shortly, lots of vaccine of yellow fever after the specific receipt that had been pooled and mobilized with human sera. After the subsequent interviews with blood donors, got to know that some had a recent infection of catarrhal jaundice and among them one of them was sick at the time of donations. The outbreak was proven to be of HCV origin through a serological analysis conducted 40 years later among selected individuals who had been involved in the original vaccine programme.

In 1940s, transfusion-associated jaundice had been described and it became a recognized complication of the treatment of haemophilia following the plasma product therapy in the subsequent years [10-16].

Virologic characteristics

Studying different literatures and topics, it's been known that Hepatitis C virus has been introduced in 1989 and the main cause of hepatitis is due to acute, chronic, liver failure and hepatocellular carcinoma. The characterization of genetic organization and the properties of viral proteins have been done. Different subtypes and more than 50 genotypes have been identified and the genotypes 1, 2 and 3 are the most commonly observed in the patients from the USA and European Countries [17-19].

For interferon treatment, Genotype is considered as more resistant. Within a single patient, the hyperavailability of HCV is responsible and the existence of the spectrum of very closely related genome which is called as quasispecies whose main mechanism is to escape from the immune response and it may explain the chronicity mainly. Similarly, virological diagnosis is based on the detection of anti-Hepatitis C virus antibody by the ELISA test. Furthermore, regarding problems in the interpretation of ELISA tests, acute hepatitis, chronic hepatitis and in immunocompromised patients, it is very important to find mainly for HCV RNA using genome technique or anticipation of hybridization. Thus, after this, these techniques are useful to predict the response to the interferon, as it has been demonstrated that patients with low viraemia can be better responders than others and Quantification or HCV RNA detection can also be used to follow the efficiency of anti-viral or anti-retroviral drugs.

The main target of our study was mainly focused on to correlate mainly between the liver histology and Hepatitis C virus (HCV) viraemia presence, quantity of HCV genomes in almost 19 positive and 11RIBAII indeterminate patients focusing persistently on the normal ALT values over 24 months before the biopsy procedure and genotype. Then, after 24-8 months, Serum ALT values were monitored, after which patients were re-evaluated for RIBAII and presence of viraemia. The result observed was of sixteen patients who were HCV-RNA positive serum, 13 of them were confirmed position and 3 of them were indeterminate on RIBAII. The non-viraemic cases mainly include the subjects with hepatic changes going and with normal liver in whom hepatic biopsy can be avoided. A true carrier in only one case, when he was viraemic with normal liver and persistently normal ALT values.

As we have studied infection in 350 renal transplant (RT) patients with a functioning graft for pervasiveness of HCV infection and its determination was based upon second generation ELISA test (ELISA-2,Abott)including the proteins C22-3, C100-3,C33-c and 5-11 confined by second generation RIBA test (RIBA-2,Chiron).Similarly,34 received conventional immunopression, according to the test of three hundred and sixteen of these RT patients who were on cyclosporine A(CSA) therapy with or without steroids (CS) and azathioprine (AZA). According to the test report Eighty-Seven RT patients were found to the HCV-positive (2.5%) when assessed by ELISA-2tests;RIBA-2 was positive in positive in 61 cases and indeterminate in 26.In the most of the HCV-patients had antibodies against non-structural antigens (C100-3, C33-C) were observed in 18 and 70% of the cases, and HCV positive patients had antibodies against C22-3 (94%) respectively, Risk factors of developing this HCV infection includes a)the time on dialysis, b)the number of previous graft(s) and we got to know that more than 88% of the positive HCV patients had got already positive HCV before renal transplantation. Almost 41 and 64% of those with respectively normal and Increased Les before transplantation presented with a biochemical chronic deliver disease after RT. Those who were infected by HCV-positive before transplantation, and for whom the liver enzyme(LE) results were available (n=68),40 other had either a normal or transient increase in alanine aminotransferase (ALT) levels during that time, in which 28 had a chronic increase in serum ALT +/- gamma-glutamyl transpeptidase levels. There was a biochemical evidence of chronic liver disease in 33 patient's i.e. (48.5%) after the transplantation. For the HCV-positive RT patients on conventional therapy, the daily dose of AZA, CS (i.e. prednisolone) were not statistically different in the (group A) and those on CsA (group B).The daily doses of AZA,CS or CsA were not statistically different between those with a chronic increase in Les and with normal Les and the percentage of chronic abnormal Les and HCV-positive RT patients was not different between groups A and B. Amazingly, the patients who were done treatment atleast once for acute rejection with methylprednisolone had probably a lower incidence of Chronic increase in LEs. Thus, result was, Nine patients were seroconverted for HCV after transplantation; 6 of them experienced a chronic increase in LEs, 7 of 87 patients were conjugated by HBV, almost all of them had a chronic increase in LEs. So the results emphasize on the fact that ALT alone cannot be used as a surrogate marker for chronic HCV infection in transplantation patients, so a liver biopsy is required few years after RT to assess liver damage in this population.

Immunopathogenesis

A recent known member of the family which is called flaviviridae, which is and most important cause of viral hepatitis i.e. acute and chronic and liver cirrhosis of the immune response to this pathogen along with immunity compared in flavivirus infections like hepatitis B have similar nature but there was high rate of viral persistence after acute hepatitis and liver failure. The incidence of persistence, acute hepatitis C after viral infection is more and the neutralizing antibodies are not protective known by the observation, so it would suggest as there are variety of important segregation between hepatitis C, hepatitis A, hepatitis B and other occurred flavivirus. Similarly, the other viral factors which have been proposed to immune evasion by

hepatitis C virus ad it's the growing body of research, its mechanism of evolution of quasispecies. The established persistent infection, the specific-virus and cytotoxic T-lymphocytes may involve some control over this viral replication. Thus, the protective immunity and the role of innate immune response were included after the early exposure of hepatitis which remains to be defined.

Hepatitis C is considered as a Major public health problem and main agent responsible for this disease is due to non-A and non-B hepatitis which was known as the virus in 1989and mostly 3% of world's population has the persistent hepatitis virus infection. Liver failure, hepatic fibrosis, liver cirrhosis and the hepatocellular carcinoma are the progressive factors due to which patients are at risk. Furthermore, Chimpanzee was the one and only animal on which experiment was done for the suspicion of HIV infection, but in progress of the research activity, it is hampered by the lack of small animal design to enhance the pathophysiological studies and similarly the observation of retroviral treatment and different vaccine strategies [19-22].

Following the survey of the different aspects of molecular virology of this Hepatitis C virus. Different clinical aspects of Hepatitis C virus infection are just mentioned below:-

1. The hepatocellular injury and the contribution of immune responses in it.
2. Studies mainly focused on experimenting the potential components of protective immunity against Hepatic C virus and specific cytotoxic T lymphocytes (CTL)-HCV comparison.
3. The role of immune evasion of viral diversity, the other major mechanism of HCV persistence.

Epidemiology

The development of a chronic infection of HCV determines at which age it is infected more. 90% of the adults infected with HCV successfully clear the acute infection and become immune naturally. 9% proceed to chronicity and become chronic. This 9% also forms the human reservoir for the spread of infection in the community. 1% is seen to suffer from fulminant hepatic failure and die early in the acute stage. Fulminant hepatitis is a kind of hepatitis which refers to a clinical condition with fast onset and development of acute liver failure, with hepatic carcinoma encephalopathy, coma and then death in almost 70% cases. It is due to an enhanced immune response with the rapid clearing of viruses. Whereas, Babies who were given birth by the mothers who had chronic Hepatitis C virus, they became infected and among them 95%will develop persistent infection. The reason behind this is that that immune system of very young ones is less able to clear the virally infected cirrhosis/hepatic necrosis.

WHO estimates that there are approximately 350 million HCV carriers globally at present. An individual is labeled as a chronic carrier of HCV if serologic conversion to hepatitis C surface antigen is maintained for more than six months.

Transmission

The infection is transmitted through pericutaneous and permucosal exposure to infective blood and body fluids by blood transfusion or blood related products, contaminated needles usage, hemodialysis, syringes and other sharp instruments, Needle-stick injuries, oral surgery, perinatal exposure, or sexual exposure. Usually in the United States and developed countries like Canada, Australia, Europe primarily it is through sexual or parenteral exposure and main common risk factors recognized includes mainly male homosexual activity, irrational drug use, exposure to the infected blood, sexual exposure to the person infected with HCV and sexual contact with multiple partners. In India perinatal is quite more important. Regarding the modes of occupational Transmission of Hepatitis C practicioner of folk medicine and those who are involved in Hairdressing, Ear peiercing and tattooing are in greater risk. Khaja [3] suggests that renal transplant, haemodialysis, surgery prior to 6 months of infections were found to be prominent causes triggered with the factors like multiple sex partners and multiple blood transfusions in his research.

As HCV had been found in our different body fluids such as Saliva, Vaginal and menstrual discharge, colostrum's, seminal fluid, serous exudates and breast milk etc and these are also considered as one reason for the source of spreading infections. Various studies show that HCV is much more transmissible than Human Immunodeficiency Virus (HIV).The research among the patients in Teku Hospital showed that risk of transmission of needle stick injury is substantially higher for HCV compared to HIV.

In Teku Hospital, almost 2700 patients infected with HIV 100 are affected with HCV (3.703%).

Materials and Methods

TEKU Hospital, Teaching Hospital, Nepal Red Cross Society (Nepal Blood Bank) is prominent Health centers of Nepal which serves as a primary facility as well as tertiary referral center. The patients for the study purpose were defined as any personnel coming in contact with HIV or other such chronic liver disease and jaundice. The subjects of study were approached at sites of convenience, asked to fill a questionnaire, and provide a free diagnostic test for Hepatitis C virus for all patients. Before contacting individual patient, the protocol of study was presented in the hospitals, Nepal Research Council (NHRC), and got it approved. Each participant was informed of their test individually. The study in Teku Hospital took the reference of past medical history of patients since 2002 to 2012 till now, and regarding Nepal Blood Bank, Annual Progress Report of medical year 2011/012 is accessed for reference.

Questionnaire designed

Questions to be asked to patients are following:

1. Demographics including age, Sex, profession, Marital status, Referred by Education
2. Past History including Jaundice and other sexual activities, History of Surgery
3. Family history like HBV/HCV or other type of hepatitis in family
4. Anti HCV test by ELISA or Screening Test
5. Investigations of Normal serum level
6. Liver Biopsy or Liver Ultrasound

Serological study

To perform serologic analysis Serum samples were freezed and stored at -70degree Celsius. Entire serum samples were inspected for antibody to hepatitis virus (Anti HCV). Anti-HCV is observed through enzyme immunoassay (EIA). Today third generation test (EIA-#) is extra sensitive and specific than previous generations. However, as with every enzyme immunoassays, false positive outcomes are accordingly an issue with EIA-3. To resolve this issue we do some confirmatory test.

Immunoblot assays are used to ensure anti-HCV reactivity. These confirmatory tests are also called "Western blots". Serum samples are incubated on nitrocellulose strips and these strips are blotted with four recombinant viral proteins. When color of blotted strips is changed then it indicates that antibodies are adhere to the proteins. If two or more proteins react the immunoblot is consider positive but if we obtain one positive band then is uncertain. The confirmatory test by immunoblotting is beneficial in some clinical situations like the subject with anti-HCV spoted by EIA which have test negative for HCV RNA, The EIA and anti-HCV reactivity shows a false-positive reaction restorate from hepatitis C, or have a very low level of virus and viral infection will be continued. And if the result come anti HCV positive then patient has more chances to recover from hepatitis C And if result of immunoblot is negative, the EIA result come in false positive.

Immunoblot test are performed on daily basis when we found an anti-HCV sample by EIA. And these test showed anti-HCV reactivity. If results are uncertain then we need to perform more test to ensure the specificity for HCV RNA.

PCR amplification

PCR Amplification is a process which detects especially low level of HCV RNA in a sample serum. HCV RNA was a different and perfect way of demonstrating that HCV infection was present and was considered as the most important test for the infection.

Similarly, testing for this HCV RNA by this PCR Amplification technique was particularly helpful when aminotransferases were Normal only lightly elevated and when anti-HCV was not present, or when various causes of hepatic/liver diseases were possible. This technique also helped in diagnosing hepatitis C in people who were immunosuppressed and have had recently and organ transplant or has a severe renal failure. Presently, there were no PCR assays approved by the the Food and Drug Administration for simple use, however commercial test systems were also available. These drugs ,different commercial laboratories offered their own PCR assays, which were not a subject strict independent quality control. Thus, the specificity and Reliability of the PCR technique were not standardized. Furthermore, it was known to be expensive and prone to the technical or laboratory error. So when, ordinary HCV RNA testing by this PCR, the technician should use a enhanced –quality laboratory willing to document standardization of this test.

Normal serum ALT levels

A few patients with chronic hepatitis have normal range of ALT even u performed the test multiple times. When the diagnosis of chronic hepatitis C may be questioned then it should be confirm by performing test of HCV RNA. If the HCV RNA is present it indicates that patient is suffering from viral infection even its ALT Levels lie into normal range.

Statistical analysis

The questionnaire collected was entered into database. Then this data was analyzed using EPI info version 8 (Epidemiology information Package, Center for disease control, Atlanta). Simplest data analysis technique is used and it include calculation of odd ratio for hepatitis C infection by each variable of interest, including and variables are sex, age, profession, marital status, history of jaundice, invasive procedure, and history of blood transfusion and practice of Universal precautions.

All available information on each variable was used. Age and total No of years of exposure were analyzed as continuous variables in the model by grouping the data. Age categorized as less than or equals to 29, 30-39, 40-49, 50-59 and >=60 yrs and total years of exposure of disease categorized as less than or equals to 5, 6-10, 11-15 and greater than or equals to 16years is taken in account for grouping. For all the above analysis probability value of 0.05 or less show the significance of this statistical data.

Outcomes

Demographics

2700 patients study were done in Teku hospital, In the same way annual report(2011/2012)which we got in Nepal Blood Bank ,Kathmandu, the proportion of those approached that participated in the study was a bit more. All the questionnaires were properly filled and have complete information for analysis. We done this study on people who had age between 22 to 45 years and they were suffering from hepatitis from last 6 to 7 years and we plotted our data accordingly.**6.2 Seroprevalence of HCV**

There was a high frequency of HCV in all the patients infected with HIV. According to the Research done in Teku Hospital more than 100 among 2700 patients were infected with hepatitis C. As well as the annual report from Nepal Blood Bank, among the collected samples from 85 centers in 62 districts, 685 people are infected (Table 1).

Graphical representation

Prevalence of HCV Virus with respect of age of the patient to the Number of years of exposure

(Figure 1,2,3)

Percentage of Blood tranfusion: 4%

Percentage of Universal Precaution(sometimes): 10%

Reports from Nepal Red cross Society

Laboratory investigations

In the blood bank when they provide safe blood and blood products to needy patients then at that time they do all the routine test

Characteristic	Number of HCV +	Number of years of experience
Sex		
Male	60	10
Female	40	7
Age Class		
<= 29	10	5
30—39	20	7
40—49	50	10
>= 50	20	9
Jaundice		
Yes	20	
No	80	
Blood Transfusion		
Yes	5	
No	0	
Universal Precaution		
Sometimes	10	
Always	0	

Table 1: Distribution of study according to Teku Hospital

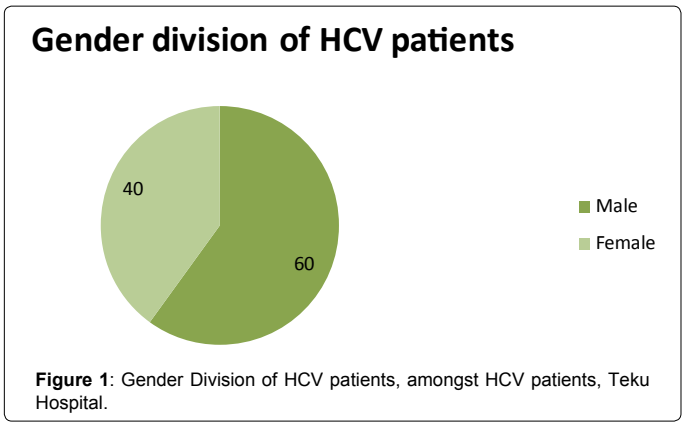

Figure 1: Gender Division of HCV patients, amongst HCV patients, Teku Hospital.

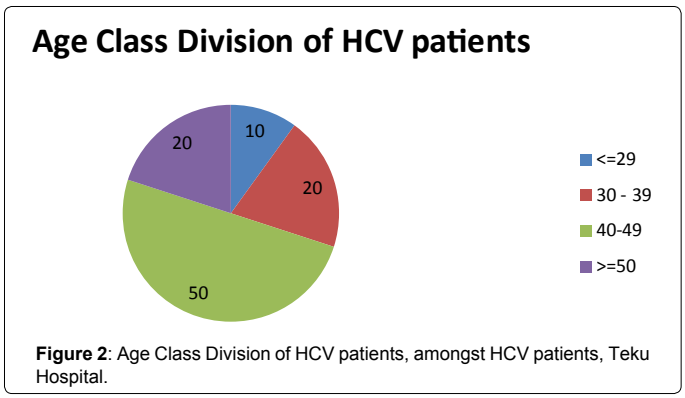

Figure 2: Age Class Division of HCV patients, amongst HCV patients, Teku Hospital.

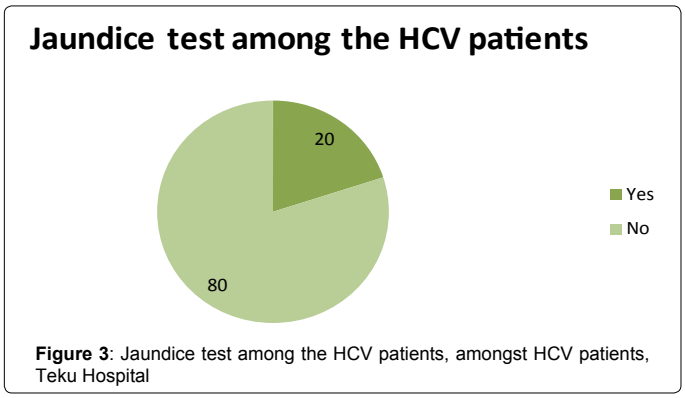

Figure 3: Jaundice test among the HCV patients, amongst HCV patients, Teku Hospital

for Cross matching HIV, HBsAg, HCV, Syphilis and anti-D antibody identification and titration in center. Kathmandu, chitwan, Bhaktapur and pokhara these cities produced blood products like plasma, packed red cells, platelets, cryo-precipitates, platelet rich plasma they provide services to the patients of hemophilia and other blood disease. Blood Component production technology is sensitive and expensive: we couldn't access this facility in all blood centres. In near future some other districts and regional blood centers are also going to provide this service. Timely detection of Transfusion Transmissible infections is being focused and each unit of blood collected is well-tested. Counsel the pre and post donor related to their good health and detection of various diseases like HIV hepatitis B and C and syphilis.

Blood group percentage

Blood group percentage of blood donors are as follows: (Table 2), (Figure 4, 5)

District and peripheral blood centers and hospital units (Table 3)

The Nepal Red Cross Society, as stated above, was able to collect 1, 77,503 units of blood during the period which was an increase of about 4.5% over the collection of the previous year. Among the blood donors male constitutes 84.4% and female15.6%.

Sex distribution of the blood donors: (Table 4, 5)

Discussion

In sub Indian belt, for landlocked countries like Nepal, open land route facilitate the biological and virological spread of diseases. So is the case of HCV, millions of migrant workers act as a biological transporter. Khaja suggests that 10 – 20% of HCV case in USA is spread through sexual route. Suggest that this might be predominate route for viral transmission because 80% of US citizen is heterosexual. Likewise, In Nepal Homosexuality and statistical reports on it is still a case that needs a wide re-opening. It can be predicted that heterosexuality could

Blood Group	National		In Kathmandu	
	%positive	%Negative	%positive	%Negative
A	28.4	0.8	30.5	0.7
B	36.5	0.9	25.0	0.8
0	28.9	0.9	32.0	0.8
AB	13.2	0.4	9.9	0.3
Total	**97.0**	**3.0**	**97.4**	**2.6**

Table 2: Blood Grouping Table [Red Cross Society, Annual Progress Report 2011, 2012]

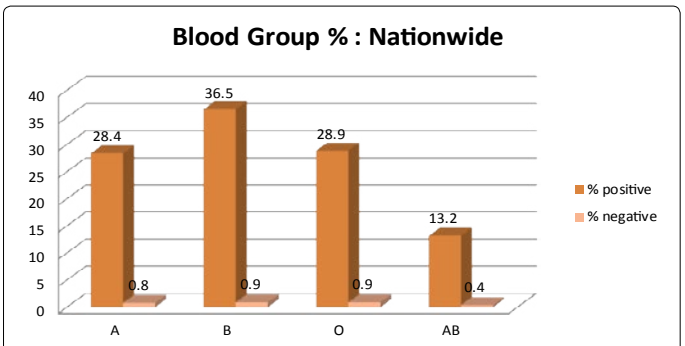

Figure 4: Blood Grouping percentage: National wide [*Red Cross Society, Annual Progress Report 2011, 2012*].

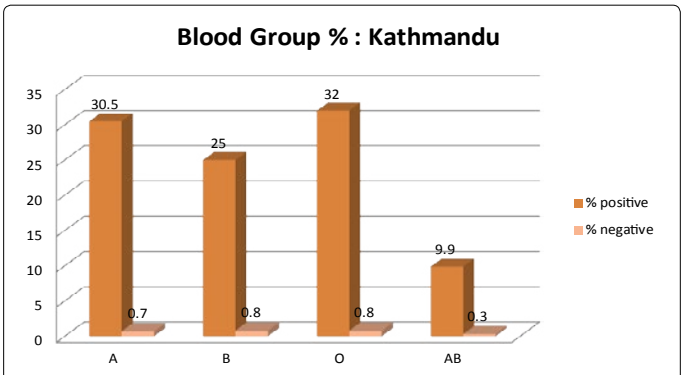

Figure 5: Blood Grouping percentage: Kathmandu, [*Red Cross Society, Annual Progress Report 2011, 2012*].

Central	1	Kathmandu
Regional Centre's	4	Pokhara, Biratnagar, Nepalgunj, Chitwan
District Centre's	21	Illam, Jhapa, Sunsari, Terhathum, Saptari, Siraha, Dhanusha, Parsa, Makwanpur, Nawalparasi, Bhaktapur, Kavre, Baglung, Rupandehi, Dang, Surkhet, Bardiya, Jumla, Kailali, Kanchanpur, Panchthar
Emergency unites	31	Damak,Okhaldunga,Solukhumbu,Sankhuwasabha,Ramechhap,Sindhupalchok, Pyuthan,Arghakanchi,Rautahat,Nuwakot,Gorkha,Gulmi,Dailekh,doti,Taplejung,Myagdi,Dolakha,Udayapur,Salyan,Dhankuta,Sarlahi,Bajhang,baitadi,syanja,Bara,Bhojpur<khotang,Rolpa,Bajura,KAlikot.
Hospital Units	28	Bir hospital, Maternity Hospital, T.U Teaching Hospital, Patan Hospital, Kathmandu medical college, Mission Hospital, Sheer Memorial Hospital, Kanti children Hospital, Nepal military Hospital, Nepal Police Hospital, Nepal Medical College, Shahid Gangalal National Heart centre, Manipal medical college, Universal Medical college National medical college (Birgunj), Dr.Megh Bdr.Parajuli community Hospital (Illam), District Community Hospital (Lamjung), Padma Hospital (Kailali), TikapurPHC (Kailali), Team hospital (Dadeldhura), District Hospital (Achham), District Hospital (Humla), BPKM cancer Hospital (Chitwan), Janaki medical College(Dhanusha), Nepalgunj Medical College (kohalpur), Lord Buddha Medical College(palpa), Kist Medical College, Amda Hospital Jhapa

In Nepal we have 85 centers in 62 districts

Table 3: Lists of centers and district hospitals, [*Red Cross Society, Annual Progress Report 2011, 2012*].

Sex Distribution	Nationwide
Male Donor	84.4%
Female Donor	15.6%

Table 4: Sex distribution national wise, [*Red Cross Society, Annual Progress Report 2011, 2012*].

SN	Centers	HIV	Hepatitis C
1	Central blood Transfusion Centre	213	451
2	Regional Blood Transfusion Centre	216	115
3	District/Emergency Blood Transfusion Centre	22	107
4	Hospital Blood Transfusion Unit	2	12
Total		**263**	**685**
%of positivity in Kathmandu Valley		0.31	1.0
Total positive percentage nationwide		0.14	0.38

Table 5: No of HIV and Hepatitis C detected in the collected Blood during the period, [*Red Cross Society, Annual Progress Report 2011, 2012*].

be much in percentage in our societies. So predomination of sexual route can be predicted as major cause for countries like Nepal.

However documentation of HCV with past infection is frequent in person with routine parenteral exposures; indicate that the transmission by this line is efficient. Accidental Parenteral exposures such as Needle-stick injuries are quite common in patients.

Another route of transmission is having Tattoos, drug addicts, heterosexual and homosexual sex, liver diseases, and blood transfusion.

The significantly higher prevalence of HCV, about 60 to 70 people was from low budget workers working in India and totally illiterate. Other important factors are the low socio economic status of this group and lack of knowledge on the modes of transmission of the disease. Frequent contact with sharp instruments including hollow-needles during their disposal and spillage contaminated with blood and body fluids occur in course of work. In Primary prevention programme we focus to devaluate the transmission of the virus. In prevention programs we should educate the persons, who have chances to acquire the viral infection, we should counsel such persons that how they reduce the chances to get viral infection we should tell them about HCV screening and harmful effects of drug abuse.

We need to provide more attention and care to populations at correctional institutes, Drug treatment programs and also arrange programs for youth to aware them about HCV. HIV Counselling and screening centre's and also at STD clinics**.** In such places physicians usually prefer intravenous drug use. In the educating process our main focus should be on addiction care by help of psychotherapy and detoxification. Always use safe and sterilize instrument and injections it reduce chances for percutaneous exposure to blood. In developing countries we must screen the blood of donor with patient in this way screening reduce the transmission of HIV through transfusion.

Treatment (Medications used especially in Nepal)

In Nepal, we focused mainly in Teku hospital where we found maximum HCV patients. A one month long research regarding this Hepatitis C and the treatment procedure in Nepal was conducted.

At present interferon are not used in Nepal. In any emergency case, the patients are referred to India. The most prescribed medicines are: Tenofovir, Stavudine, Lamifudine, Stavudine, Nevirapine Bacterium, Vitamin/C capsules, Efavirenz, Abacavir.

Following are the Available services for Hepatitis C

1. Cost expense of HCV antibody screening is US $2.00
2. A pharma company provide free HCV RNA screening test but it is not at large scale.
3. In Nepal we do not have facilities to treat HCV, so they move to other countries to treat their HCV infection. Due to reduce resources we don't have reach to HAV and HBV vaccination.
4. Medication therapy available in Nepal are AZT (Azidothymidine), 3TC (Lamivudine) and Nevirapine and in second line we have only ARV.

The usual prescribed for HCV is HAART(Highly Active Antiretroviral Therapy) regimen is a combination of Zidovudine 300mg, Lamivudine 150mg and Nevirapine 200mg. Course of drug prescribed is that you take Zidovudine 300 mg, Lamivudine 150 mg for 14 days and after that twice a day (BD) and Nevirapine 200mg once daily (OD).

Then after, patient should start taking Nevirapine 200 mg BD twice a day. Second common prescribed regimen comprises of a combination of ZDV 300mg, 3TC 150 mg, this combination should to be taken BD along with Efavirenz (EFV) (600 mg or 800 mg) which u take before sleep. Combination of Stavudine (d4T) 30 mg, 3TC 150 Mg and NVP (Nevirapine) 200 mg is preferred when ZDV (did not become the initial choice).

Conclusion

Emphasis should be made to prevent the occupational health in patients, by creating awareness on the risk of HCV infection, especially to the illiterate and non-professional health care workers, following strict compliance with Universal precautions especially using one-

hand technique for recapping needles and decontamination of sharp instruments before cleaning them by non-professional workers. The awareness campaign for cross boarder migrant workers could be conducted so as to educate them about HCV and the ways to prevent it.

Suggestions to Improve the HCV Therapy

Government should take positive steps for betterment of public health by providing free HCV antibody test and also offer follow up diagnostic tests on daily basis and add Pegylated interferon and Ribavirin in the essential medicines list of Nepal.

Government should organize workshops on HIV/HCV co-infections for policy makers which includes CCM (Comprehensive Care Management) members, Health ministerial secretary and also for other institutions which take steps to provide better and effective therapy to HCV patients.

Limitations Needed So Far

A comparison of the effectiveness of different antiviral drugs with the drugs in present use could put light on which would be advantageous for the mass. Another such comparison that could have helped make our results more concrete is between effectiveness of oral antiviral drugs in presence and absence of interferon. But due to lack of proper resources, these analysis have been postponed .We can proceed these limitations for future Research Need Projects so far.

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